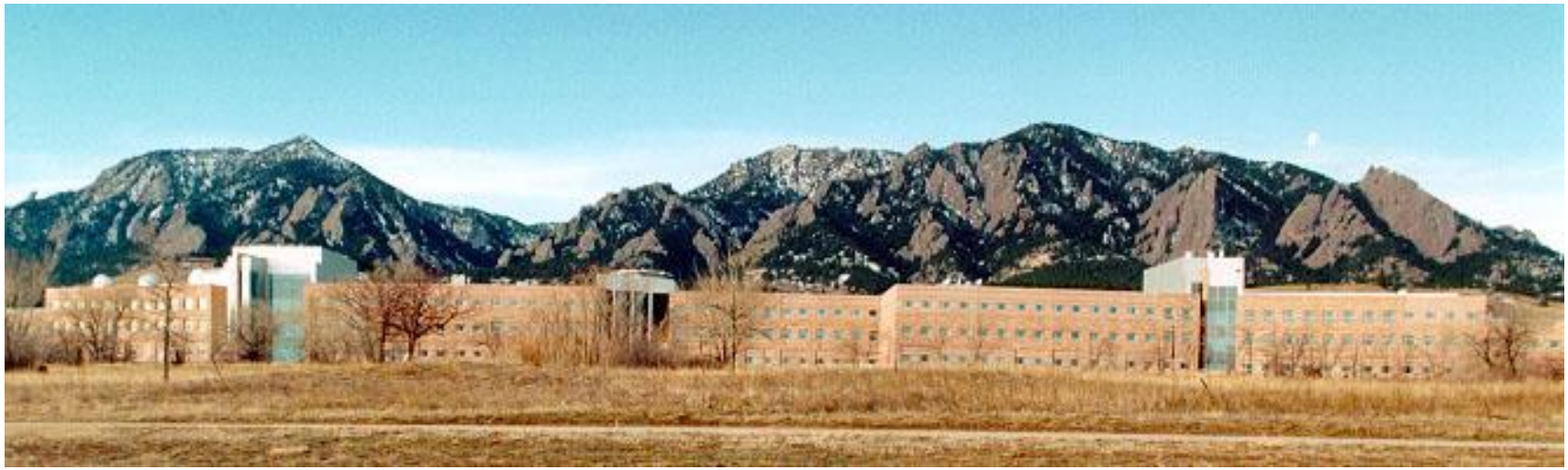

STP Quarterly Review

14 Oct 2009

4QFY09

Dr. William F. Denig, Chief
Solar & Terrestrial Physics Division
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OUTLINE

Solar & Terrestrial Physics Division

- **STP Program Overview**
- **Milestones & Performance Measures**
- **Awards & Personal Achievements**
- **Accomplishments**
- **Special Interest Items**
- **Ionospheric Technology Demo**
- **Issues & Summary**

Solar & Terrestrial Physics Division
Personnel

Solar & Terrestrial Physics Division
William Denig/F, Chief
Janet Brown/F, Secretary
Karen Horan/F, Physical Science Tech
Craig Clark/F, Scientific Data Tech

Earth Observation Group (EOG)

Chris Elvidge/F, Team Lead
- Kim Baugh/C
- Ben Tuttle/C
- Tilottama Ghosh/C
- Daniel Ziskin/C

Key
F – Federal
C – CIRES/CIRA
S – Student
G – Guest Scientist

Space Environment Group (SEG)

Eric Kihn/F, Team Lead
- Terry Bullett/C
- Ray Conkright/C
- Ed Erwin/F
- Rob Redmon/F
- Herb Sauer/G
- Dan Wilkinson/F
- Kelly Prendergast/F
- Jim Manley/C
- Pat Purcell/C
- Peter Elespuru/C
- Anu Sunaravel/S
- Janet Machol/C @ SWPC
- John Schminky/S

Earth Geophysics Group (EGG)

Vacant/F, Team Lead
- Patrick Alken/C
- Rob Prentice/C
- Fran Coloma/C
- Justin Mabie/C
- Don Herzog/G
- Andrea Bilich/F, NGS
- Dan Winester/F, NGS
- Tim Wilkins/F, NGS
- David Schmerge/F, NGS

STP Division Overview
Personnel Changes

- **Gains**
  - Pat Purcell – CIRA RS (SEG) – NPOESS S/W Engineer
  - Janet Machol – CIRA RS (SEG) – SWx Product Developer @ SWPC
  - NGS Feds (3) – Dan Winester, Tim Wilkins & David Schmerge
- **Losses**
  - Helen Coffey – Guest Scientist - Discontinued service
  - Matthew Niznik – Hollings Scholar (SEG) – University of Miami
  - Salman Naqvi – Hollings Scholar (EOG) – NJ Institute of Technology
- **Vacancies**
  - SEG Solar Physicist – Refocused to Geomag + Solar Data Manager
  - STP Real-time Data Manager – On hold
  - EOG Data Manager – On hold
- **Inbound**
  - SEM-N Algorithm Transition Liaison – Active search – CPI
- **Reassigned**
  - Anu Sunaravel – CIRES PRA – Transition to GOES-R support

STP Division Overview
Agreements – Status

STATUS

Scope	Team	Type	Partner	NOAA Legal	DOC Legal	NGDC Signed	Partner Signed	Start	End	Status	
CORS Support	EGG	AGR	NGS	n/a	n/a			01-Oct-03	30-Sep-09	Y	*FYI - Renewal in process*
SWx Climatology	SEG	MOU	AFCCC	X	X	X	X	27-May-04	01-Oct-14	G	In place - nothing to report
GPS Data (CORS)	EGG	MOA	Multi	n/a	n/a			20-Sep-04	n/a	Y	*FYI - Renewal in process*
NASIC	EOG	MOU	NASIC	X	X	X	X	09-Mar-06	01-Jan-11	G	In place - nothing to report
Ionospheric Data	SEG	MOU	AFWA	X	X	X	X	21-Aug-06	21-Aug-11	G	In place - nothing to report
DMSP Archive	SEG	MOA	DMSP					*TBD*	*TBD*	R	*Expired - requirements unknown*
Ionosonde Sites	SEG	MOU	USGS	X	X	X	X	06-Apr-09	05-Apr-14	G	In place - nothing to report
SEM-N - AFRL	SEG	MOA	AFRL	X	X	X	X	11-May-09	11-May-14	G	In place - nothing to report
Nighttime Lights	EOG	MOU	DOE	X	X	X	X	09-Sep-09	30-Sep-13	G	In place - nothing to report
Earth Imagery	EOG	MOU	NGA					*TBD*	*TBD*	Y	*In-limbo - awaiting customer interest*

Updated: 13 Oct 09

STP Division Overview
AFWA Visit – 11 Sept 09

- **Archive & Access USAF Datasets**
  - **What are AFWA archive needs/requirements?**
  - **Is there an expanded/deminished role for NGDC?**
  - **What are the alternatives for acquiring 5D-3 SWx data?**
  - **Expiring MOA – should we leverage the umbrella MOA?**
- **Applications for DMSP OLS Data**
  - **Info Only – Please pass on the good message**
- **SWx Climatologies**
  - **Is there AFWA interest in this dataset?**
- **Space Environment Impacts System**
  - **Is there an AFWA need for this application?**
- **Algorithms for NPOESS SWx EDRs**
  - **What is AFWA's baseline method for auroral boundary spec**
  - **Requesting feedback on processing alternatives for IPO**

STP Division Overview
CDMP – Status

STATUS

Dataset	Funded in FY09	Proposed for FY10	POC	Contractor ($K) - FY09	Contractor ($K) - Expended YTD	NGDC - FY09	Proposed ($K) - FY10
DMSP film scanning (L3)	√	√	Elvidge	403.0	328.1	40.3	TBD
Historical ionosonde records (L7)	√	√	Redmon	93.0	53.1	9.3	TBD
Historical solar spectral data (L16)	√	–	Morrill (NRL)	50.0	18.3	5.0	TBD
Historical solar observations (L18)	√	–	Horan	50.0	49.7	5.0	TBD
Cosmic rays - Forbush archives (L42)	√	√	Denig	98.0	87.4	9.8	TBD
Heat capacity mapping mission (L44)	√	√	Elvidge	434.0	412.0	43.4	TBD
NGS Multi-Lens (L50)	√	√	Elvidge	32.0	21.6	n/a	TBD
Geomagnetic Film Data (*TBD*)		√	Mabie				100.0

Updated: 12 Oct 09

STP Division Overview

Income Sources / Distributions (Draft)

Space Environment Group (SEG)

Source	Name	Sub-task	Planned	Proposed	Expected	Received	Amount	OD Tax	Federal Labor	Federal Travel	CIRES/CIRA Grant	Contracts	S&E	Other
NOAA	Base Fund - Salaries						*TBD*							
NOAA	Base Fund - other						*TBD*							
NOAA	Base Fund - Travel						*TBD*							
non-NOAA	NASA-VIRBO	SEG-2	√				50,000	5,000			45,000			
non-NOAA	AFCCC	SEG-2	√				100,000	10,000			90,000			
non-NOAA	AFWA-IONO	SEG-5					0							
NOAA	NVDS	SEG-1	√				90,000		25,000			15,000		50,000
NOAA	CLASS	SEG-1	√				440,000		25,000	10,000	115,000	80,000		210,000
NOAA	GOES-RRR	SEG-3	√				60,000		49,000	7,000			3,000	1,000
NOAA	CDMP - Solar	SEG-4	√				15,000		10,000		5,000			
NOAA	CDMP - Ionosphere	SEG-5	√				7,500				7,500			
NOAA	NPOESS SEM-N	SEG-6	√				165,000	85,000			35,000	45,000		
NOAA	NPOESS Advisory	SEG-6	√				80,000		65,000	15,000				
							1,007,500	100,000	174,000	32,000	297,500	140,000	3,000	261,000

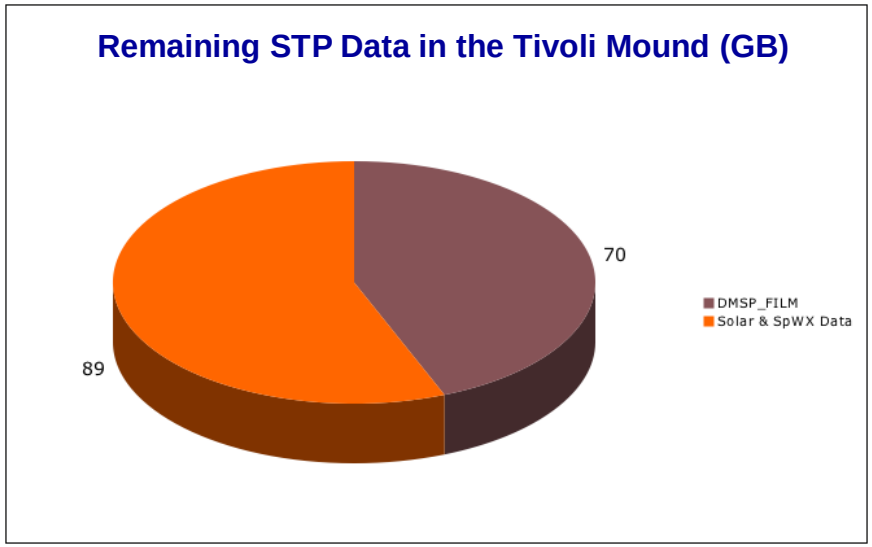
Earth Observation Group (EOG)

Source	Name	Sub-task	Planned	Proposed	Expected	Received	Amount	OD Tax	Federal Labor	Federal Travel	CIRES Grant	Contracts	S&E	Other
NOAA	Base Fund - Salaries						*TBD*							
NOAA	Base Fund - other						*TBD*							
NOAA	Base Fund - Travel						*TBD*							
NOAA	CDMP - EOG	EOG-1	√				90,000		50,000		40,000			
NOAA	Coral Reefs	EOG-1	√				45,000				45,000			
non-NOAA	DoD/WPAFB	EOG-1	√				100,000	10,000			90,000			
non-NOAA	World Bank	EOG-1	√				92,000	9,200			82,800			
non-NOAA	Data Sales	EOG-1	√				30,000	3,000		15,000	12,000			
non-NOAA	CIA	EOG-1	√				125,000	12,500			112,500			
							482,000	34,700	50,000	15,000	382,300	0	0	0

Earth Geophysics Group (EGG)

Source	Name	Sub-task	Planned	Proposed	Expected	Received	Amount	OD Tax	Federal Labor	Federal Travel	CIRES Grant	Contracts	S&E	Other
NOAA	Base Fund - Salaries						*TBD*							
NOAA	Base Fund - other						*TBD*							
NOAA	Base Fund - Travel						*TBD*							
NOAA	NGS-CORS	EGG-1	√				286,000	22,000	39,000		125,000	100,000		
NOAA	CDMP - Geomagnetic	EGG-2	√				10,000				10,000			
							296,000	22,000	39,000	0	135,000	100,000	0	0
						Total STP Funding:	**1,785,500**	**156,700**	**263,000**	**47,000**	**814,800**	**240,000**	**3,000**	**261,000**

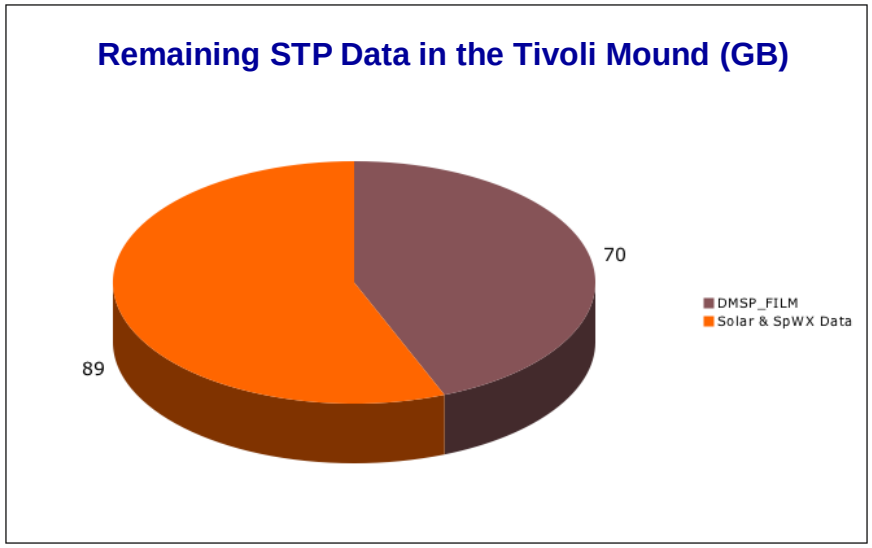
STP Division Overview
Tivoli Mound



3QFY09

Total Size: 159 GB

No change since last quarter



4QFY09

Total Size: 159 GB

	3QFY09	4QFY09
DMSP	70 GB	70 GB
AeroMag	-	-
GeoMag	-	-
Iono	-	-
SWx	89 GB	89 GB
Total	159 GB	159 GB

OUTLINE
Solar & Terrestrial Physics Division

STP Program Overview

Milestones & Performance Measures

Awards & Personal Achievements

Accomplishments

Special Interest Items

Ionospheric Technology Demo

Issues & Summary

Milestones & Performance Measures

FY09 Milestones

	PPBES Program	STP FY09 Milestones	Status	Planned Completion Date	Actual Completion Date	Responsible Person
AOP →	Space Weather	Complete data rescue of available synoptic solar drawings from the Wendelstein Solar Observatory for the period 1946-1987.	C	(Q1) 12/31/2008	(Q1) 12/31/2008	Horan / Fischman
AOP →	Marine Transportation Systems	Develop a generalized methodology for the detection of coral reef bleaching from satellite-based imagery.	C	(Q1) 12/31/2008	(Q1) 12/31/2008	Ziskin
	Marine Transportation Systems	Initiate reprocessing of Defense Meteorological Satellite Program (DMSP) imagery for the period 1992-2005 using new software procedures providing archival product consistency.	C	(Q2) 3/31/2009	(Q2) 2/28/2009	Erwin
	Space Weather	Implement new visualization product for energetic particle data from the POES Space Environment Monitor (SEM) that will provide a planetary perspective for this environment. (SWP)	C	(Q2) 3/31/2009	(Q2) 3/31/2009	Wilkinson
AOP →	Space Weather	Release version 5 of the NOAA Space Physics Interactive Data Resource (SPIDR) utility including improved database access and metadata editing capabilities. (SWP)	C	(Q2) 3/31/2009	(Q2) 3/31/2009	Kihn
	Space Weather	Develop scripts to convert raw magnetometer data into WDC format and make those scripts available to the public to increase the useable of the NOAA data products.	C	(Q3) 6/30/2009	(Q3) 6/30/2009	Mabie
AOP →	Marine Transportation Systems	Estimate national and global gas flaring levels for 2008 using Defense Meteorological Satellite Program (DMSP) nighttime lights imagery.	C	(Q3) 6/30/2009	(Q3) 6/30/2009	Elvidge
	Space Weather	Provide functional requirements and mapping to the CLASS Developmental Team for the Simple NOAA Archive Access Portal (SNAAP) API.	C	(Q3) 6/30/2009	(Q3) 6/30/2009	Kihn
	Marine Transportation Systems	Complete development of a radiance calibrated global nighttime lights product set for Defense Meteorological Satellite Program (DMSP) spanning 1996-2006.	C	(Q4) 9/30/2009	(Q4) 9/30/2009	Elvidge
AOP →	Space Weather	Acquire and archive historical GOES 8-12 “raw” data files currently maintained by the NWS Space Weather Prediction Center (SWPC) on CD. (SWP)	Y	(Q4) 9/30/2009	*Cancelled*	Wilkinson
	Space Weather	Release version 2 of the MIRRION ionospheric sounding data collection, processing, and dissemination system for increased station capabilities and improved reliability.	C	(Q4) 9/30/2009	(Q4) 9/30/2009	Redmon

AOP → AOP milestone

C **Complete**

G **On-track**

Y **Watch Item**

R **Issue**

Milestone (Internal NGDC)
Radiance Calibrated Nighttime Lights

Milestone: Complete development of a radiance calibrated global nighttime lights product set for Defense Meteorological Satellite Program (DMSP) spanning 1996-2006.

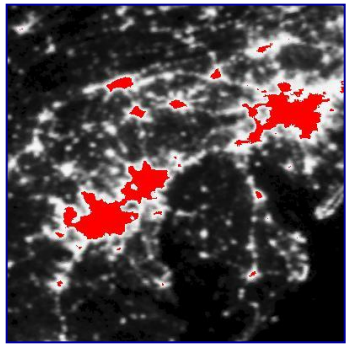
Background: Most of the nighttime visible band data in the DMSP archive were collected at high-gain settings resulting in light saturation for urban centers thereby reducing the scientific value of the annual nighttime lights composites. Requested nighttime lights imagery with reduced gain settings have now been assimilated into the composites using calibrated data values for the bright cores of urban centers.

Completion Date:

Planned	(FY09-4Q)	30Sep09
Actual	(FY09-4Q)	30Sep09

Significance: The quantitative value of nighttime-light composites has been increased for research studies, including modeling the spatial distribution of economic activity and CO_2 emissions from the distributed combustion of fossil fuels.

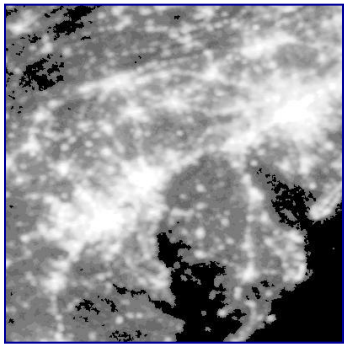
Before



Operational nighttime light imagery are saturated within the bright cores of urban centers (marked red).

NGDC requested data collections at reduced gain settings are used to produce annual nighttime light composites corrected for saturation.

After



Milestone (AOP)
Historical GOES 8-12 "Raw" Files (1 of 2)

Milestone: Acquire and archive historical GOES 8-12 "raw" data files currently maintained by the NWS Space Weather Prediction Center (SWPC) on CD. (SWP)

Background: SWPC directly acquires the GOES 8-12 raw telemetry stream and generates satellite data files which are managed in-house and backed-up to CD. The intent of this milestone was to include the raw data files in the NGDC official archives so that high-resolution Space Environmental Monitor (SEM) data could be processed in the future and made publically available. The results of an internal assessment revealed that any large-scale reprocessing of the SEM data would be difficult to achieve due to inconsistencies in the data records and the lack of available manpower. However, during FY09 we also learned that NESDIS maintains the complete GOES data record under tighter configuration control and that NESDIS has tentative plans to reprocess the GOES historical data as a part of the transfer of mission responsibility from SWPC to NESDIS. The decision was therefore made (by WFD) that this milestone was in principle complete and that any effort to archive the GOES 8-12 raw data was not required.

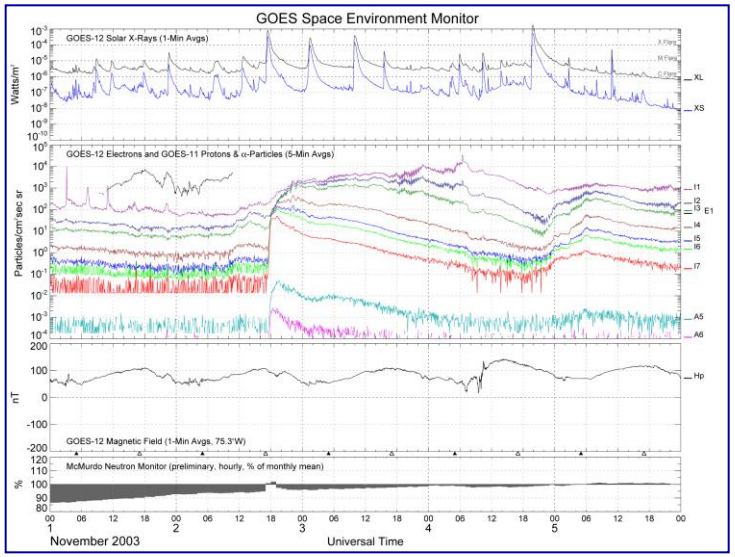
Completion Date:

Planned	(FY09-4Q)	30Sep09
Actual	Cancelled	

Significance: NOAA environmental datasets need to be safeguarded and made publically available.

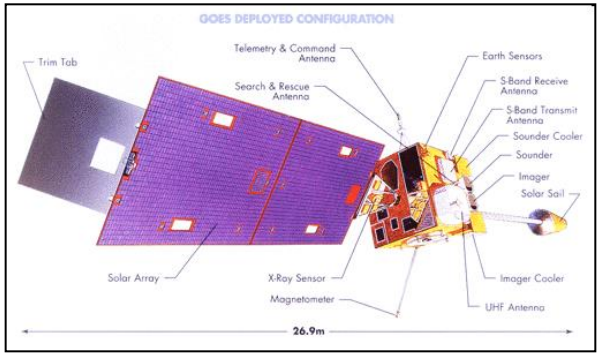
Note: There is a significant risk that the re-processing of the historical high-resolution GOES 8-12 data will not be accomplished due to higher priorities within NESDIS.

Milestone (AOP)
Historical GOES 8-12 "Raw" Files (2 of 2)



Milestone: Acquire & archive historical GOES 8-12 "raw" data files currently maintained by the NWS Space Weather Prediction Center (SWPC) on CD. (SWP).

GOES SEM plot. Only averaged GOES 8-12 SEM data are publically available.



Background: STAR plans to reprocess the historical GOES 8-12 Space Environment Monitor (SEM) high-resolution data as a part of the overall transfer of mission responsibility from SWPC to NESDIS. This milestone is therefore no longer required. However, there is a risk that competing priorities and funding limitations may adversely affect the reprocessing of the historical high-resolution data.

Completion Date:

Planned	(FY09-4Q)	30Sep09
Actual	Cancelled	

Significance: NOAA environmental datasets need to be safeguarded and made publically available.

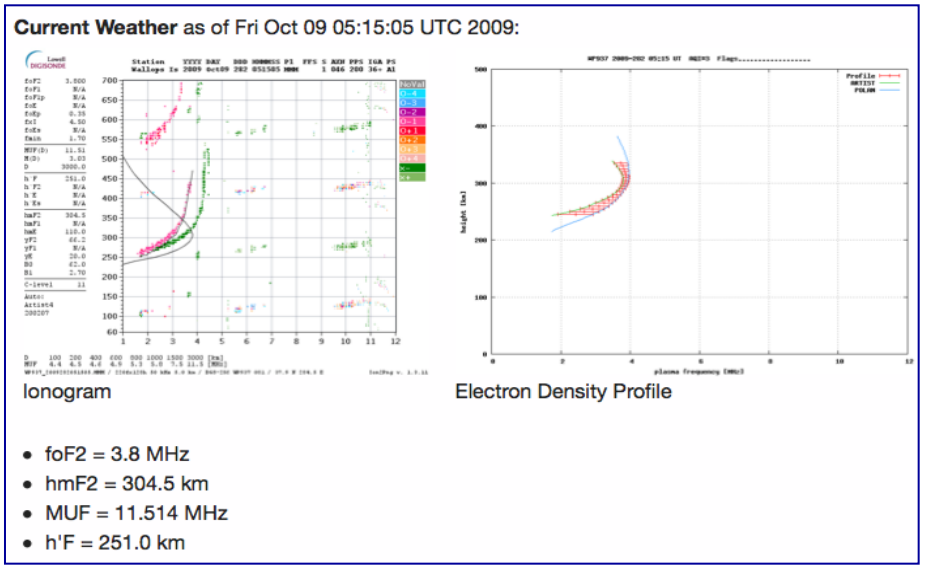
Milestone (Internal NGDC)
MIRRION Version 2

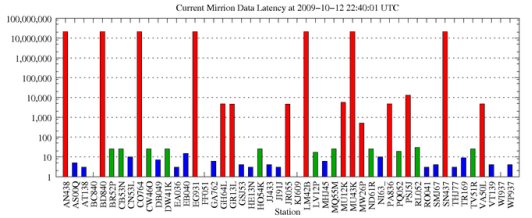
Milestone: Release version 2 of the MIRRION ionospheric sounding data collection, processing and dissemination system for increased station capabilities and improved reliability.

Background: MIRRION is the real-time ionospheric sounding data ingest and distribution system providing operational space environmental specifications for the NOAA and USAF operational space weather centrals. MIRRION-2 is housed within the NGDC.

Completion Date:

Planned	(FY09-4Q)	30Sep09
Actual	(FY09-4Q)	30Sep09





Significance: MIRRION-2 offers improved reliability, increased customer bandwidth, accommodations for additional stations, real-time data cataloging, updated QC features & a real-time "current weather" display. MIRRION-2 was funded by the Air Force Weather Agency (AFWA) through CU's Cooperative Institute for Research in Environmental Sciences (CIRES)

Milestones & Performance Measures

FY10 Milestones (Proposed)

	PPBES Program	STP FY10 Milestones (Proposed)	Status	Planned Completion Date	Actual Completion Date	Responsible Person
	Space Weather	Identify/Define retention policy for Space Weather products. Identify associated critical products needing to be stored or archived.	G	(Q1) 12/31/2009		Prendergast
	Space Weather	Conduct an Algorithm Requirements Review (ARR) for the Space Environment Monitor on the National Polar-orbiting Operational Environmental Satellite System (NPOESS).	G	(Q1) 12/31/2009		Manley
	Space Weather	Inplement on NGDC information technology (IT) systems a Solar X-ray Imager (SXI) dose radiation accumulation tool and provide associated basic web access.	G	(Q2) 3/31/2010		Wilkinson
	Marine Transportation Systems	Develop a satellite-derived global map of economic activity for 2006 using nighttime earth imagery data from the Defense Meteorological Satellite Program (DMSP).	G	(Q2) 3/31/2010		Ghosh
AOP →	Space Weather	Ingest "out of cycle" operational X-Ray Sensor (XRS) data for the Geostationary Operational Environmental Satellite number 14 (GOES 14) into the official archives.	G	(Q2) 3/31/2010		Wilkinson
	Geodesy	Reconcile the Global Positioning System (GPS) data holdings between the Continuously Operating Reference Stations (CORS) East and CORS West mirror sites.	G	(Q3) 6/30/2010		Coloma
	Marine Transportation Systems	Complete version 4 of the Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) annual stable nighttime lights covering the period 1992 to 2009.	G	(Q3) 6/30/2010		Elvidge
	Space Weather	Develop a workflow client for the Space Physics Interactive Data Resource (SPIDR) to streamline user delivery of NOAA's space environmental data.	G	(Q3) 6/30/2010		Elespuru
AOP →	Space Weather	Develop a comprehensive plan for porting Space Weather Prediction Center (SWPC) data holdings to NGDC including maintaining current Frodo access capabilities.	G	(Q4) 9/30/2010		Prendergast
	Space Weather	Develop a prototype system for the NOAA Enterprise Archive Access Tool (NEAAT) for the Comprehensive Large Array-data Stewardship System (CLASS).	G	(Q4) 9/30/2010		Kihn
AOP →	Space Weather	Complete the metadata records for the solar and space environmental sensors on the Geostationary Operational Environmental Satellite (GOES) series N-O-P spacecraft.	G	(Q4) 9/30/2010		Wilkinson

AOP → AOP milestone

C **Complete**

G **On-track**

Y **Watch Item**

R **Issue**

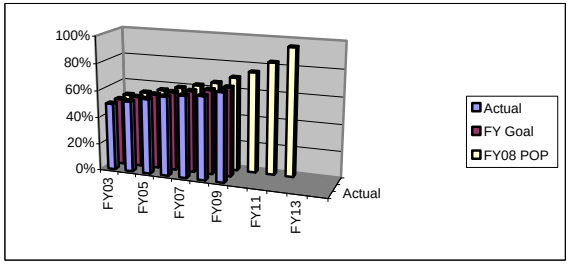
Milestones & Performance Measures

FY09 Performance Measures

Performance Measures

1 - Percentage of archived SWx data available to the public on-line

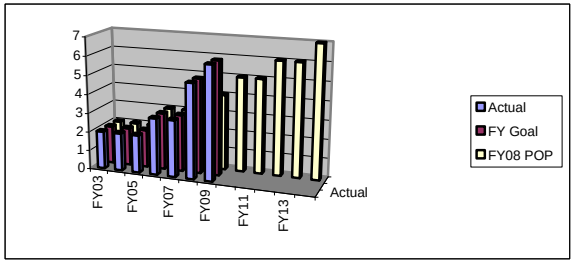
	Actual	FY Goal	FY08 POP
FY03	50%	50%	**50%**
FY04	53%	53%	53%
FY05	56%	56%	56%
FY06	59%	59%	59%
FY07	61%	61%	62%
FY08	62%	63%	**65%**
FY09	66%	66%	70%
FY10			75%
FY11			83%
FY12			**95%**
FY13			
FY14			



Current Month: Sept 2009		
This Q Planned	Actual This Q/Total	FY09 Target
66%	66%	66%

2 - Improved retrospective products for understanding the space environment

	Actual	FY Goal	FY08 POP
FY03	2	2	**2**
FY04	2	2	2
FY05	2	2	2
FY06	3	3	3
FY07	3	3	3
FY08	5	5	**4**
FY09	6	6	4
FY10			5
FY11			5
FY12			**6**
FY13			6
FY14			7



Current Month: Sept 2009		
This Q Planned	Actual This Q/Total	FY09 Target
6	6	6

Updated: 04 Oct 09

The FY2008 Program Baseline Assessment (FY08 PBA) was released 08 June 2005.

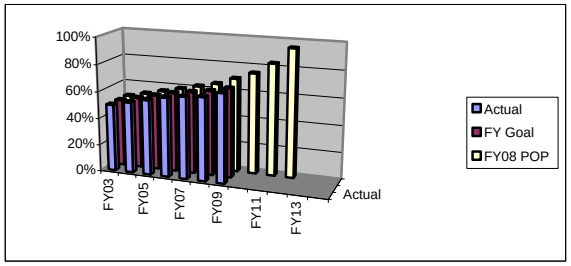
Milestones & Performance Measures

FY10 Performance Measures (Proposed)

Performance Measures

1 - Percentage of archived SWx data available to the public on-line

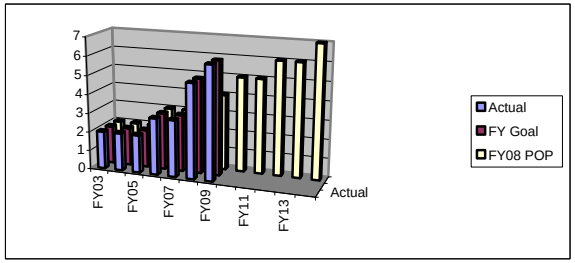
	Actual	FY Goal	FY08 POP
FY03	50%	50%	**50%**
FY04	53%	53%	53%
FY05	56%	56%	56%
FY06	59%	59%	59%
FY07	61%	61%	62%
FY08	62%	63%	**65%**
FY09	66%	66%	70%
FY10			75%
FY11			83%
FY12			**95%**
FY13			
FY14			



Current Month: *Preliminary*		
This Q Planned	Actual This Q/Total	FY10 Target
TBD	*TBD*	70%

2 - Improved retrospective products for understanding the space environment

	Actual	FY Goal	FY08 POP
FY03	2	2	**2**
FY04	2	2	2
FY05	2	2	2
FY06	3	3	3
FY07	3	3	3
FY08	5	5	**4**
FY09	6	6	4
FY10			5
FY11			5
FY12			**6**
FY13			6
FY14			7



Current Month: *Preliminary*		
This Q Planned	Actual This Q/Total	FY10 Target
TBD	*TBD*	7

Updated: 13 Oct 09

The FY2008 Program Baseline Assessment (FY08 PBA) was released 08 June 2005.

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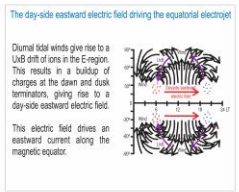
Fall AGU - Outstanding Student Paper

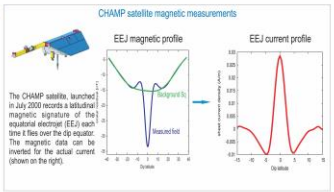
Equatorial electric field model inferred from CHAMP satellite magnetic measurements

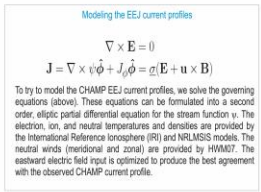
Patrick Alken (CIRES, NOAA), patrick.alken@noaa.gov
Stefan Maus (CIRES, NOAA), stefan.maus@noaa.gov

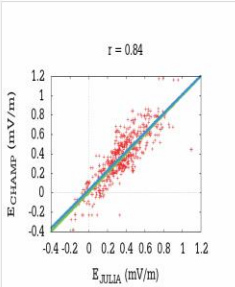
The day-time eastward equatorial electric field (EEF) in the E-region plays an important role in equatorial ionospheric dynamics. It is responsible for driving the equatorial electrojet (EEJ) current system, equatorial vertical ion drifts, and the equatorial ionization anomaly (EIA). Due to its importance, there is much interest in accurately measuring the EEF. However, there is a severe lack of high quality data on the EEF with the notable exception being the JULIA coherent scatter radar in Peru.

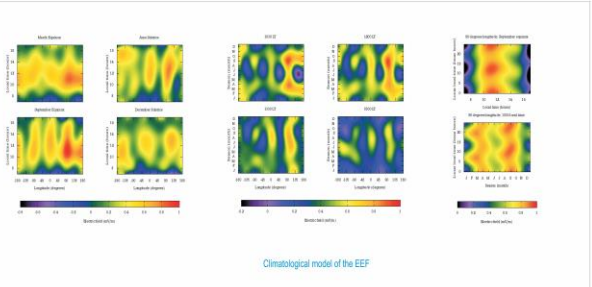
In this work we use CHAMP satellite-derived latitudinal current profiles of the day-time EEJ in order to estimate the eastward electric field at all longitudes, seasons and day-side local times. We have constructed a dataset of over 36,000 EEF estimates based on six years worth of CHAMP data. Our estimates agree well with JULIA measurements, with an RMS error of 0.13 mV/m. We have created a climatological model of the EEF mean as a function of longitude, local time, season, solar flux and lunar local time.

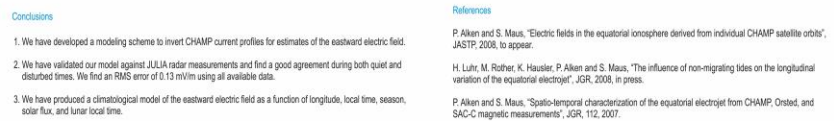




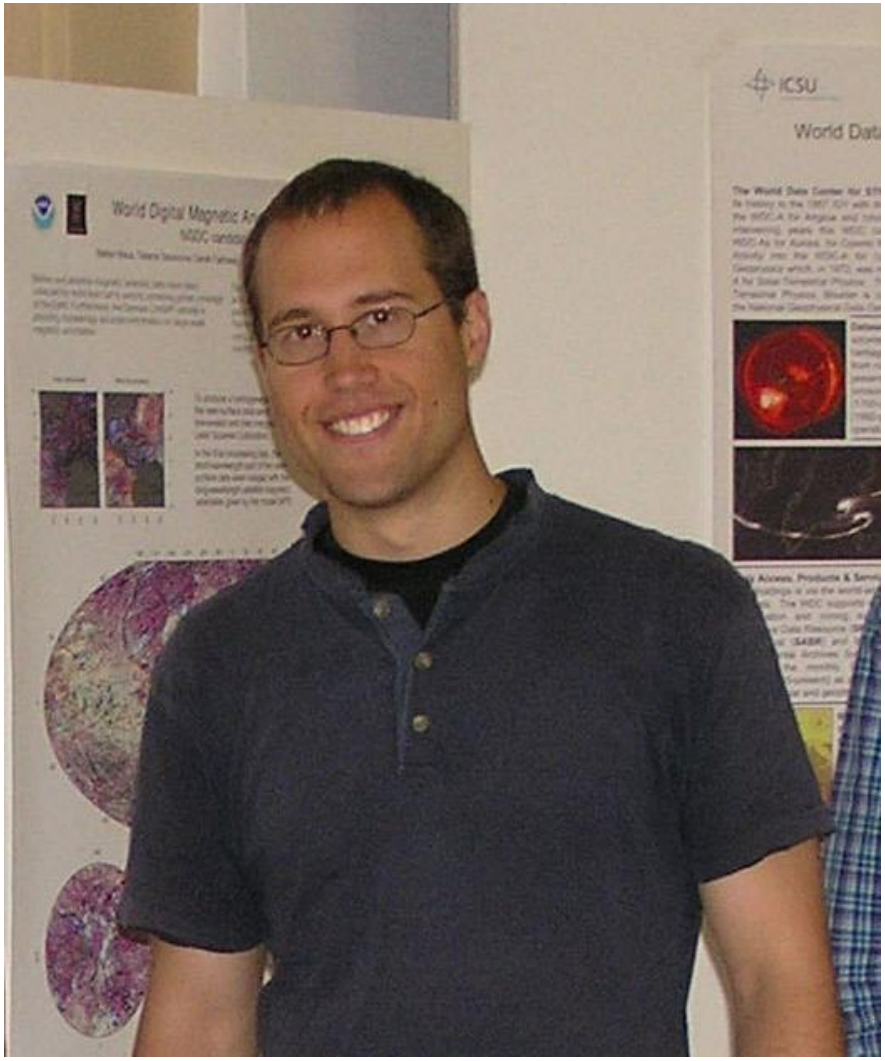








Pat Alken – 2008 Fall AGU – SPA Section



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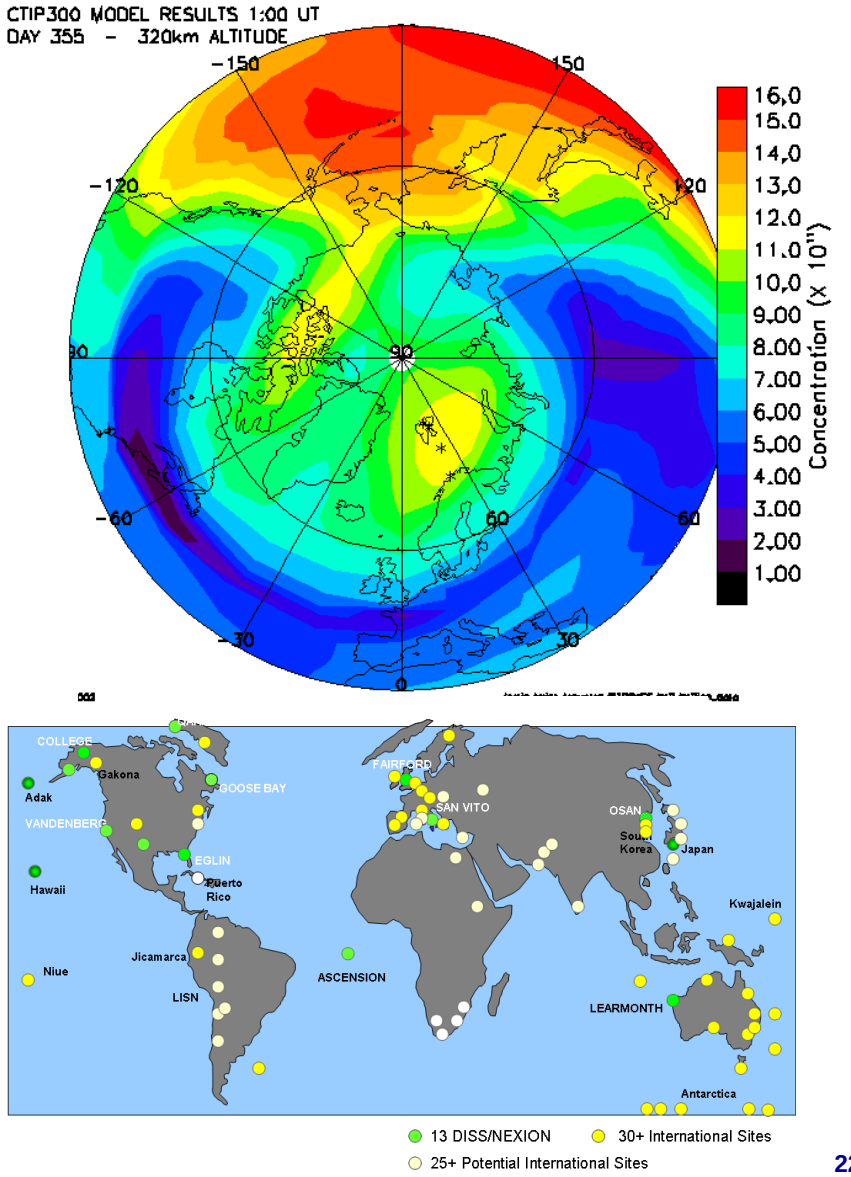
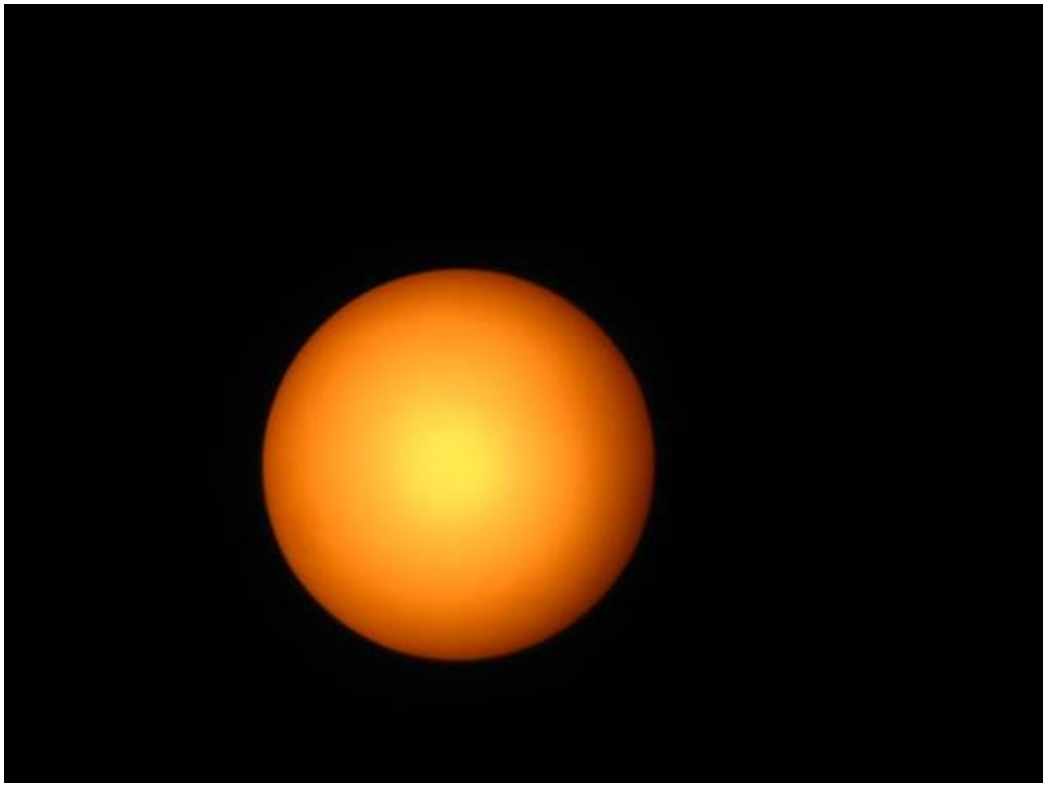
NGDC Datasets Used for Model Validation

NGDC's extensive ionospheric datasets are being used by the **NWS Space Weather Prediction Center (SWPC)** to validate the Coupled Thermosphere-Ionosphere-Plasma-sphere (CTIP) model which is a candidate for operational transition. The CTIP model provides a data/index driven specification of the near-earth space environment including global characterizations of ionospheric peak heights (h_mF_2) and densities (n_mF_2). The NGDC on-line archives include measure-ments of h_mF_2 and n_mF_2 from up to 220 stations for the last 50 years. The current CTIP validation effort is for a 11-year solar cycle.

Other recent data requests include 6 years of Tucuman (Argentina) ionosonde data for the Instituto Nacional de Técnica Aeroespacial (Spain) and extensive ionosonde records for researchers at the University of Colorado (Boulder) and University of Massachusetts (Lowell).



Accomplishment
NGDC in the News – Quiet Sun



14 Sep 2009, Bangor, ME – "Later in July, the weather got better. But well into September, the 24th observed sunspot cycle still has produced hardly anything. According to official counts from the **National Geophysical Data Center**, a smattering of sunspots appeared in the third week of June, then again in the second week of July. After July 30, there was none for the entire month of August. On Sept. 1 a little eruption was observed. Since then, clear sunning."

Accomplishment
Night Time Artificial Cloud Study

Creation of an Artificial Noctilucent Cloud

Rob Redmon and **Terry Bullett** participated in the NASA rocket experiment to investigate the formation of noctilucent clouds which are also known as polar mesospheric clouds. These high-altitude clouds are typically located at ~50 km altitude and are only barely visible during twilight when illuminated by sunlight from below the horizon while the Earth's surface is in darkness.

The **Charged Aerosol Release Experiment (CARE)** rocket was launched from Wallops Island on Sept 19th. Dust particles released from the rocket's exhaust plume were used to create an artificial noctilucent cloud which was visible along the northeastern seaboard. NGDC supported the rocket launch by specifying the local ionosphere above the launch site in order to better characterize the dispersion of the neutral/ion cloud of aerosol particles.

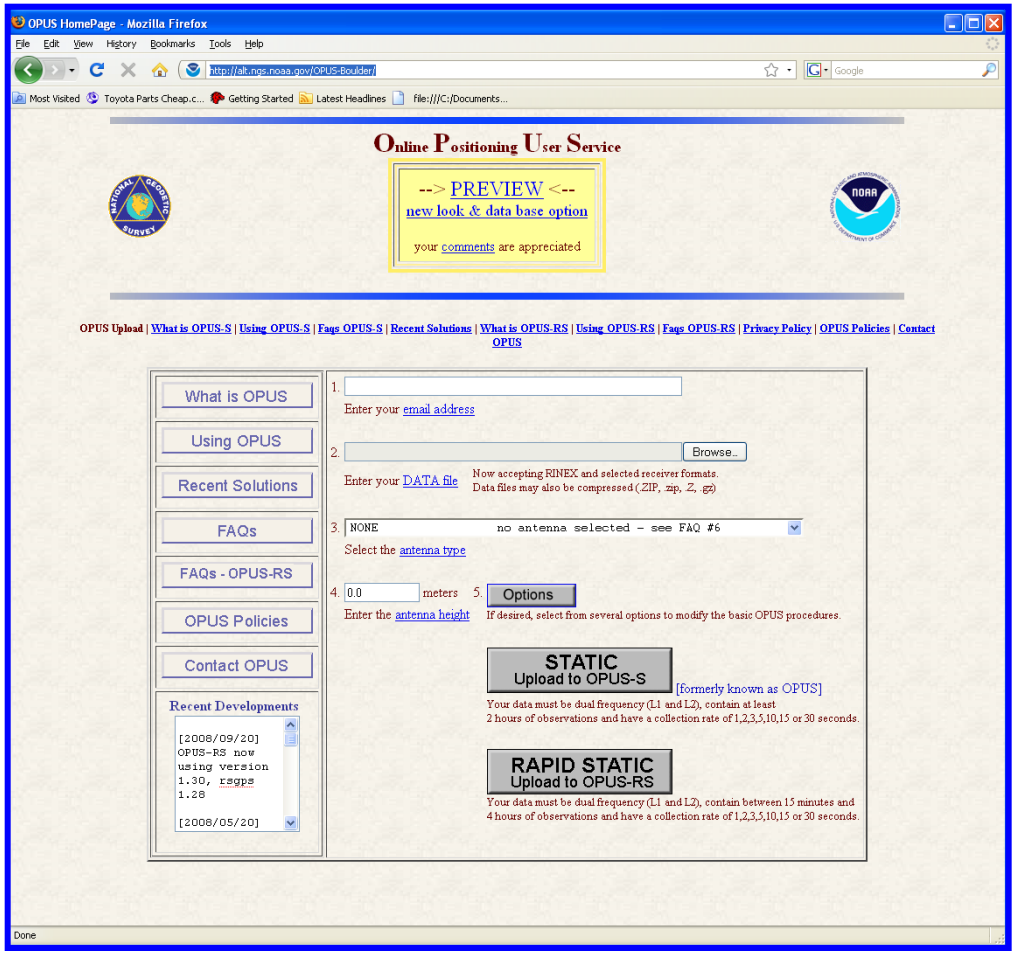
NASA Photograph

Naturally occurring noctilucent cloud as seen from Budapest

Accomplishment
OPUS in Boulder

OPUS-in-Boulder was briefed favorably to the NGS Products & Services Committee on July 16, 2009. OPUS was rewritten by NGS software engineers in Silver Spring, MD for implementation at CORS-West. This was done because NGS has not licensed the NGS database in Boulder, CO. CORS-West system administrator **Ernie Joynt** worked closely with the OPUS team in the testing and implementation of the "roll-out" package of the OPUS software. This package allows a system administrator to install OPUS on a system without requiring specialized knowledge of the OPUS software.

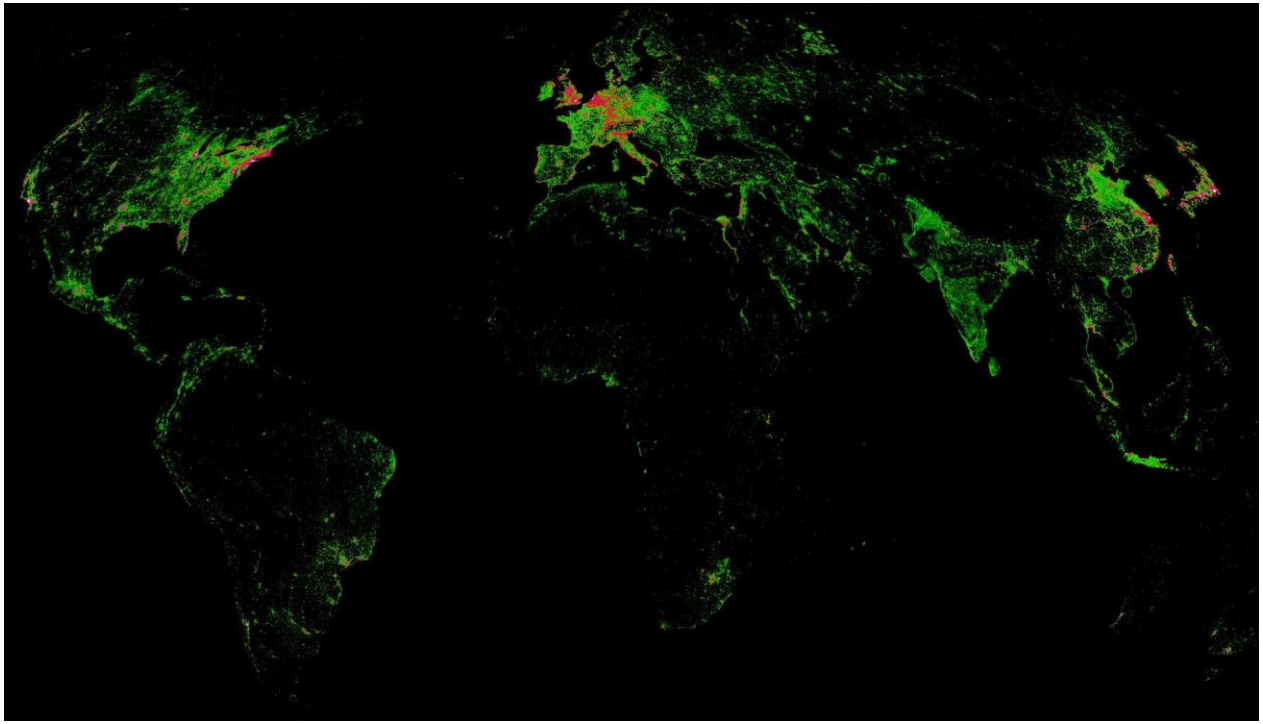
Public release of the OPUS-in-Boulder web utility is dependent upon completion of FY10 milestone to reconcile the holdings between CORS-East and CORS-West.



http://alt.ngs.noaa.gov/OPUS-Boulder/

Accomplishment
First Satellite Derived GDP Map

The NGDC Earth Observation Group is developing a first-ever global map of gross domestic product (GDP) based on satellite imagery of nighttime lights. This initial map provides a quantitative assessment of total GDP for 2006 using reported GDP plus published regional estimates of the "shadow economy", or informal GDP. The brightest regions (red to white) have a total GDP of $1M/km^2.



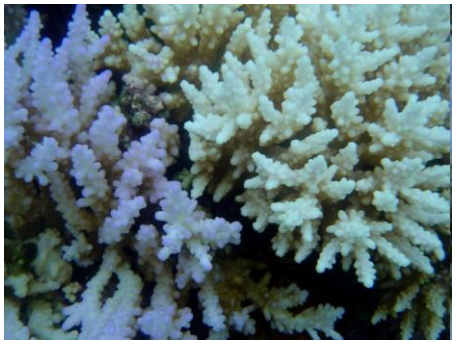
Accomplishment
NOAA's Coral Reef Information System

Metadata records have been provided to NOAA's Coral Reef Information System (CoRIS) for referencing high-resolution coral reef imagery available through the National Geophysical Data Center (NGDC). CoRIS is designed to be the single point of access for NOAA coral reef information and derived products. Coral bleaching events can be remotely sensed through radiometric comparison to reference imagery available from commercial suppliers. These coral reef metadata records will allow users to access these imagery products directly from the CoRIS inventory.

Middle Island, Australia Satellite Imagery (IKONOS)

Healthy Coral

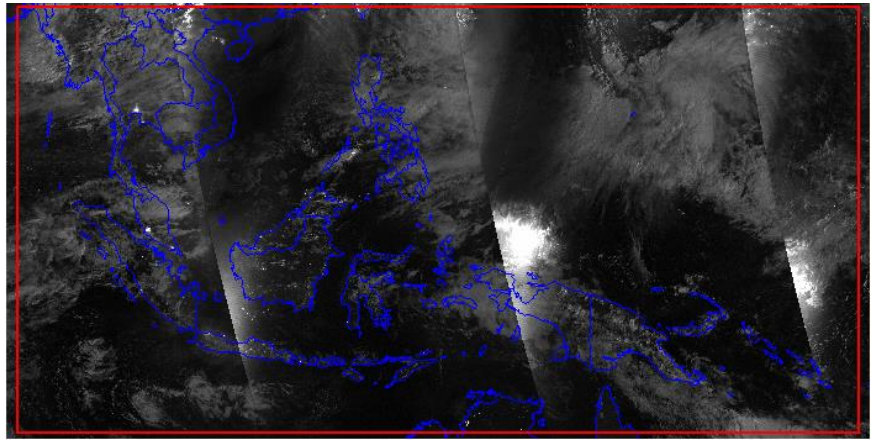
Bleached Coral



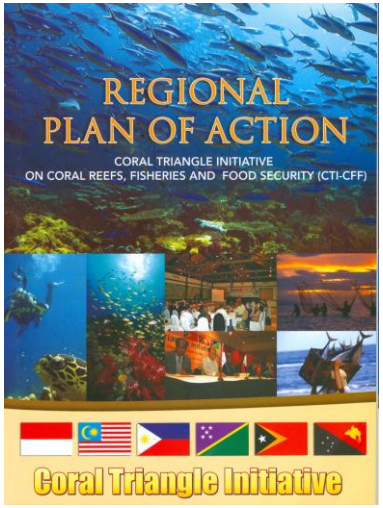
Coral images from the NOAA Photo Library

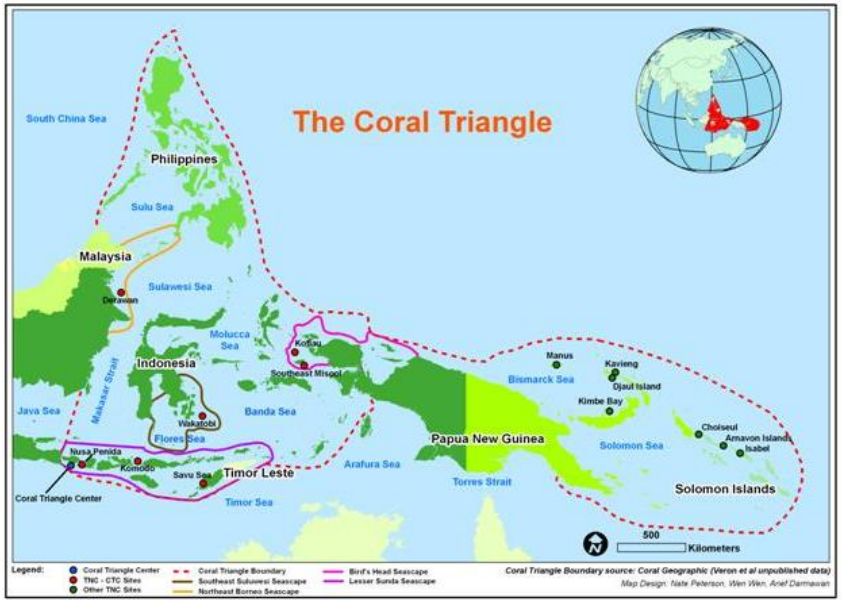
Accomplishment
NGDC – Coral Triangle Initiative

The NGDC Earth Observation Group has established an open access web coverage service (WCS) for near real time visible and thermal band DMSP-OLS mosaics of the ASEAN region. This NOAA service is now available at: http://www.ngdc.noaa.gov/eog/maps/cgi-bin/public/ms/cti/dl.



The 5.7 million km² of the Coral Triangle is home to the highest diversity of marine life on earth. The Coral Triangle is recognized as an area of global significance, significance, blessed with over 75% of known coral species, over 30% of the world's coral reefs, over 3,000 species of fish and the greatest extent of mangrove forests of any region in the world. Establishment of this service was funded by NOAA's Coral Conservation Reef program in support of the Coral Triangle Initiative.





ASEAN = Association of Southeast Asian Nations

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Increased Cosmic Ray Backgrounds

NASA Report: Cosmic-Ray Concentrations Highest in Half a Century

According to Richard Mewaldt (Caltech), “In 2009, cosmic ray intensities have increased 19 percent beyond anything we've seen in the past 50 years. The increase is significant, and it could mean we need to re-think how much radiation shielding astronauts take with them on deep-space missions.” *Softpedia*, Tudor Vieru, 30 Sep 2009.

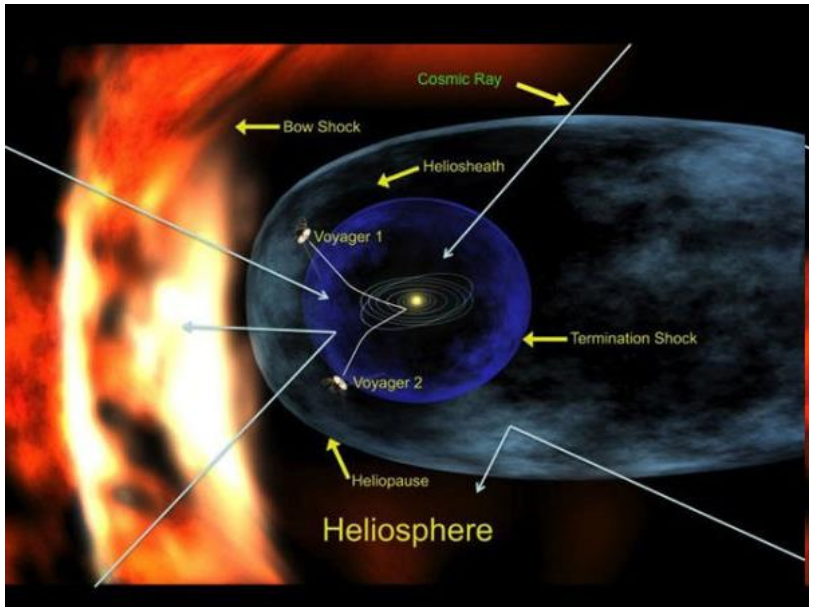
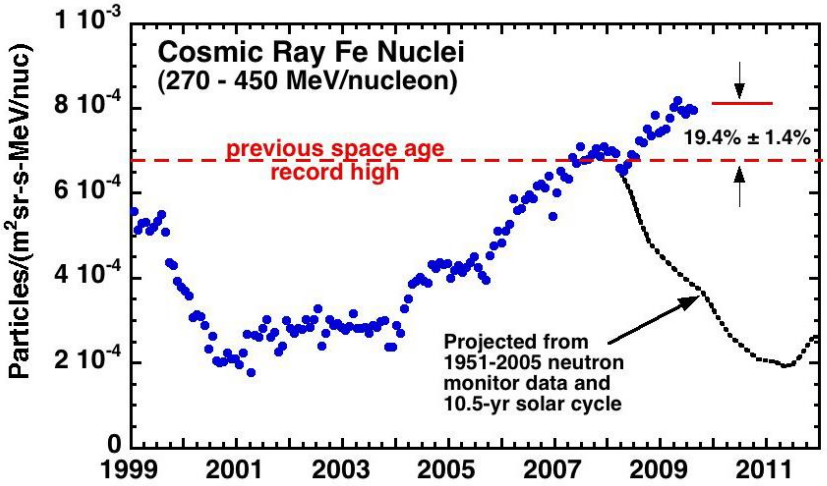
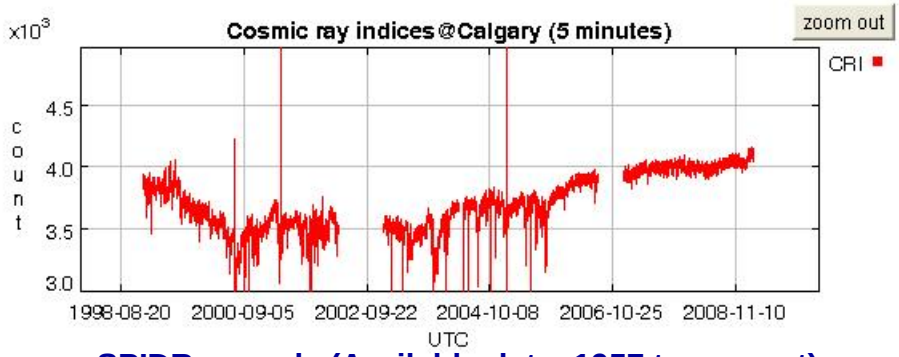


Image credit: Richard Mewaldt / Caltech

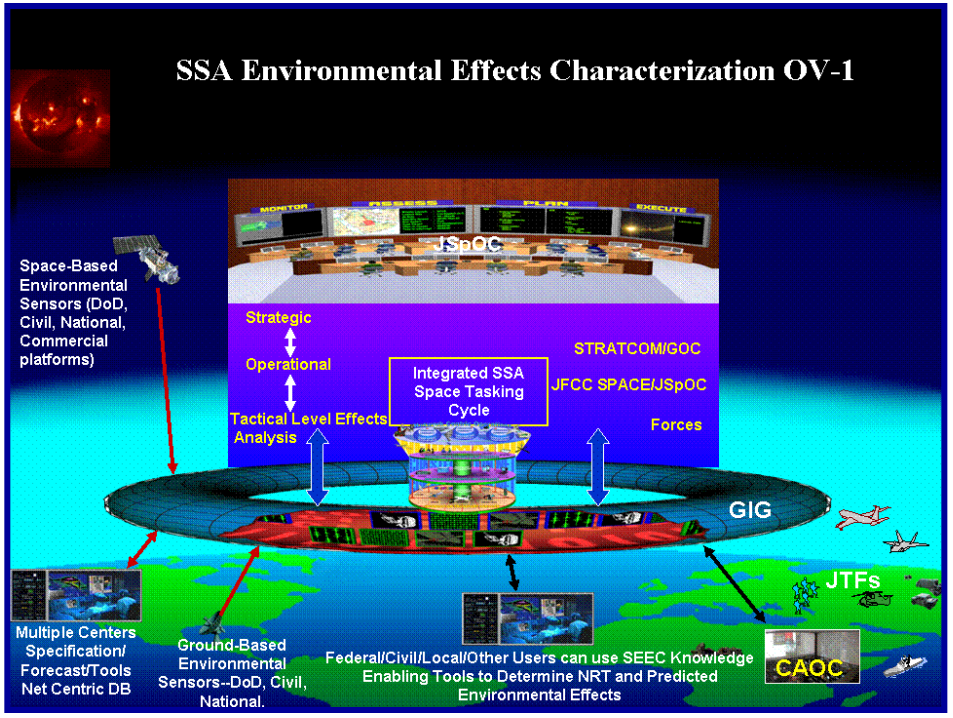


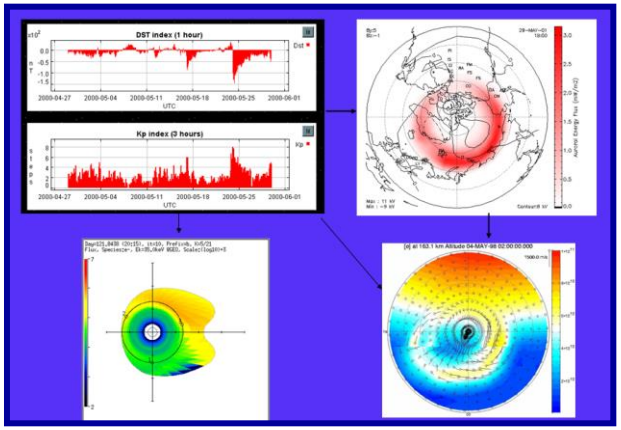


SPIDR records (Available data: 1957 to present)

Special Interest Item
Military Interests in SEIS

Eric Kihn recently briefed the Air Force SPace Command (AFSPC) on NGDC's Space Weather Analysis (SWA) program & associated Space Environmental Impact System (SEIS). Environmental Effects Characterization is a key element in military Space Situational Awareness (SSA). The AFSPC is interested in these applications for use in missile defense exercises. Dr. Kihn technical overview and demonstration of these environmental impact tools which were developed for DoD's Air & Space Natural Environment (ASNE) community.

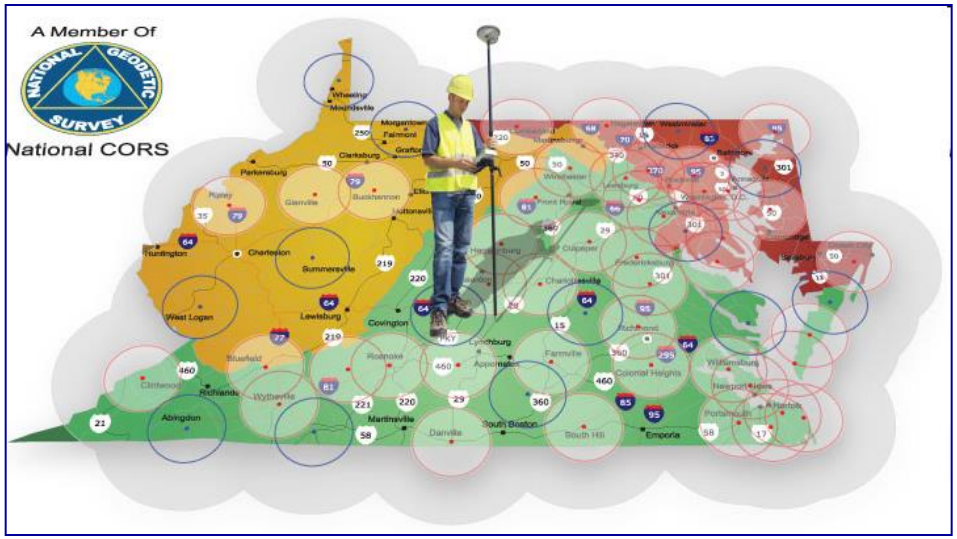




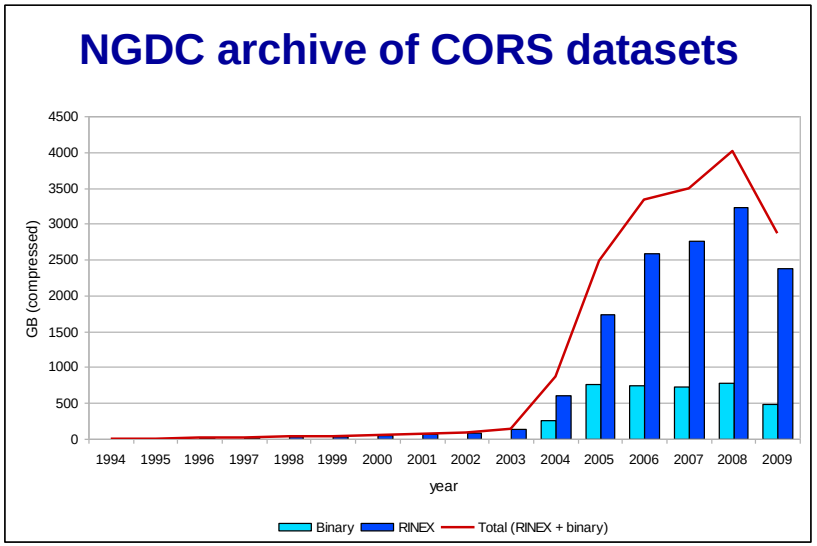
Products and rules developed at NGDC used to support SSA in DoD modeling and simulation.

Special Interest Item
NGS CORS User Forum

Francine Coloma recently participated in the National Geodetic Survey's (NGS) Continuously Operating Reference Stations (CORS) User Forum as part of the U.S. Coast Guard Navigation Center (NAVCEN) 49th Civil GPS Service Interface Committee Meeting (CGSIC) in Savannah, GA, 21-22 Sep 2009. This year's CORS User Forum featured a panel of speakers discussing the guidelines being prepared to help those who operate a Real-Time GNSS Network (RTN) as well as those who use RTN positioning services.

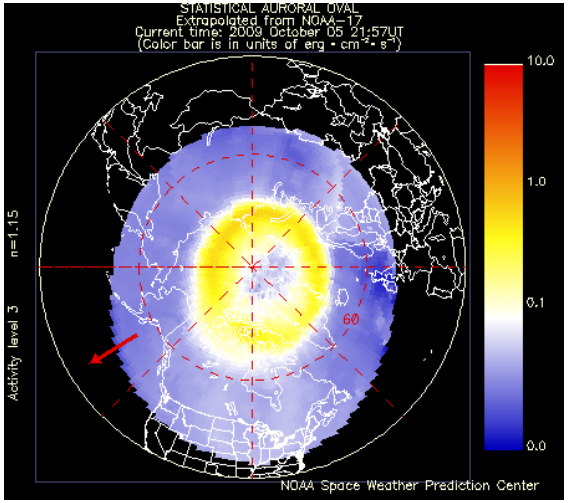


RTN network image from http://leica.loyola.com/email/090310/

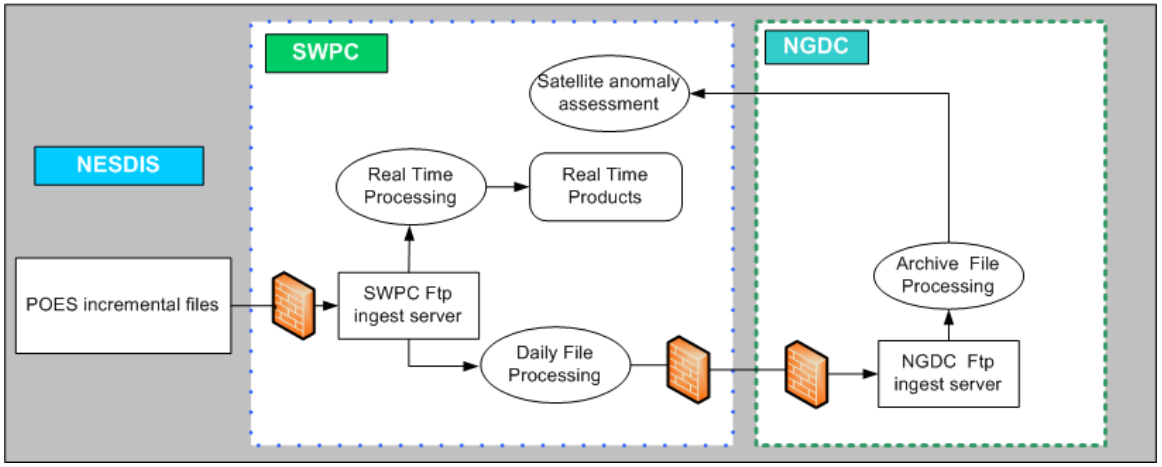


Special Interest Item
POES Data Processing

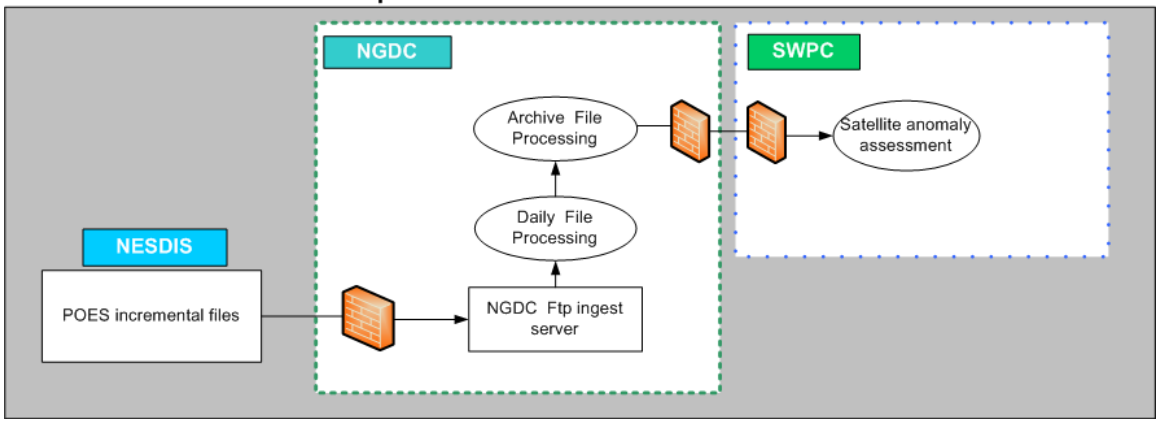
SWPC is investigating options for terminating the real-time processing of POES data. They have requested that NGDC consider acquiring the raw POES data directly from NSOF for creating the daily archive files. Kelly Prendergast is drafting an SOW for processing the POES data in-house.



Current POES Archive Data Flow



Proposed POES Archive Data Flow



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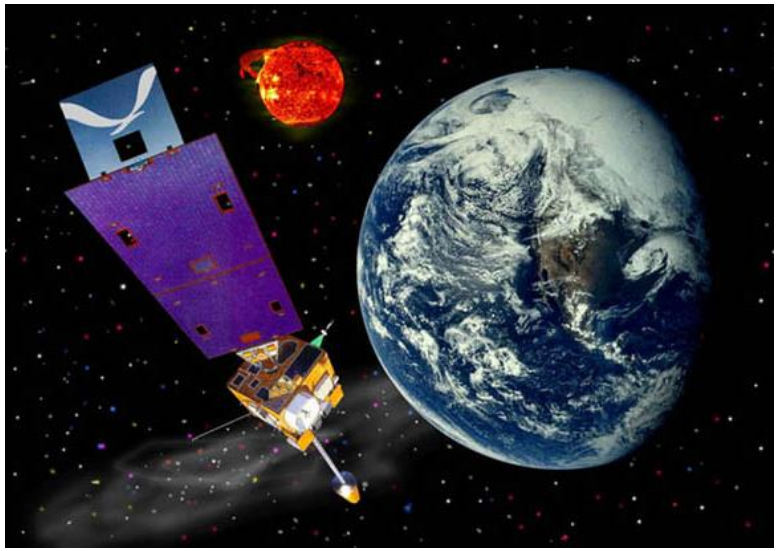
Issues & Summary
NOAA's Satellite Data at Risk

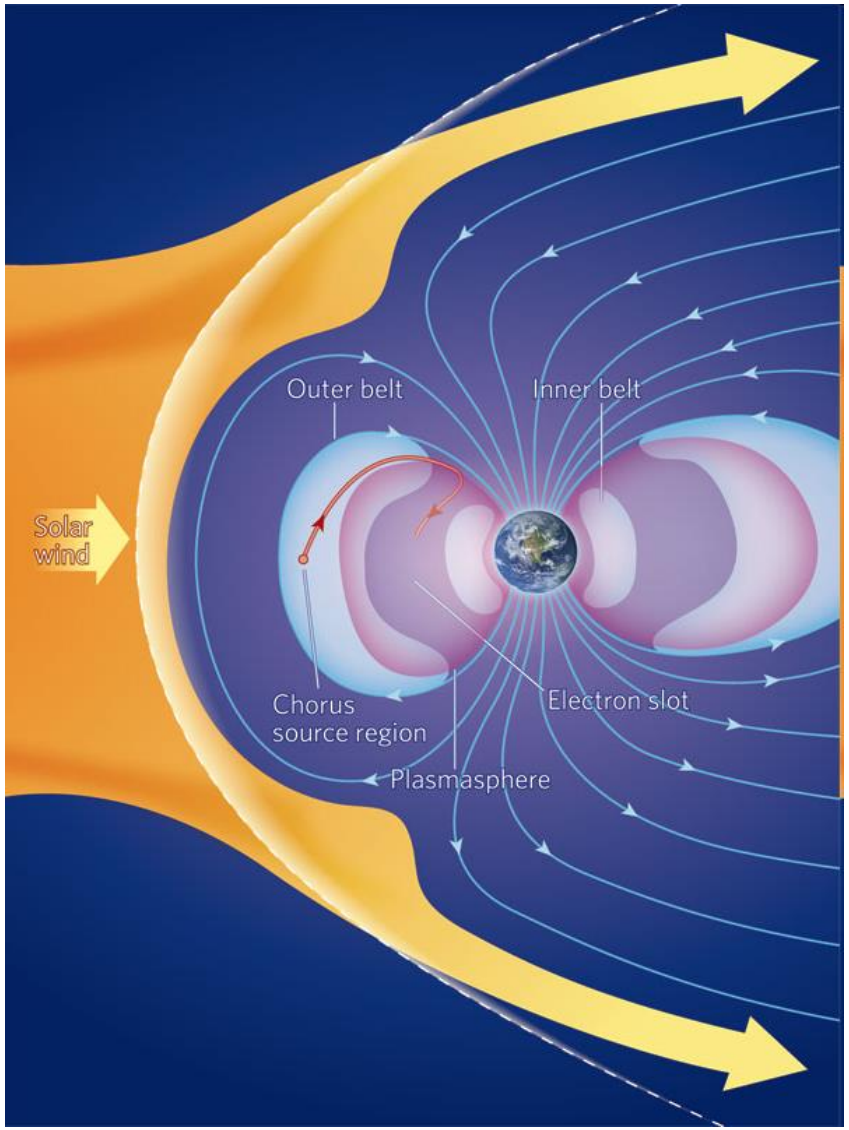
NGDC provides Scientific Data Stewardship for NOAA's space environmental data from GOES and POES in accordance with NAO 212-15. Historically, the NWS Space Weather Prediction Center (SWPC), previously the OAR Space Environment Center, assumed responsibility for the processing, quality assurance and continuity of NOAA's satellite space weather data prior to delivery to NGDC. A *proposed* initiative for the FY12-15 budget cycle shifts this responsibility from SWPC to OSDPD. In the interim, the capability for SWPC to provide a continuity of service is at serious risk due to organizational reprioritizations, funding shortfalls and loss of key personnel. Recommend that NESDIS form a tiger team to ensure that NOAA's space environmental datasets are properly maintained during this transition.



Issues & Summary
Archiving NSF Datasets

NGDC was recently contacted by Stanford University requesting archive services for data obtained under a National Science Foundation (NSF) grant. The subject dataset (ground-based) is relevant to understanding radiation-belt physics and, as such, is within NGDC's overall mission area. The Stanford dataset is currently being evaluated using NOAA Procedures for Scientific Records Appraisal and Archive Approval.

The NSF Office of Polar Program (OPP) policies require, "timely submission of OPP-award data to national data centers and other OPP-specified repositories". Relatedly, the NSF Division of Ocean Sciences identifies NGDC as the appropriate final repository for marine geophysical datasets. ***Are there any existing formal arrangements between NSF and NESDIS for reviewing and archiving datasets acquired by NSF grantees?***



Issues & Summary
List of Outstanding Issues

- **Satellite processing transition from SWPC (4QFY04) – new**
- **Continuity of solar data services (1QFY09) – active**

✓ *Refocus of NWS/SWPC Objectives (2QFY08) – NLAI*

- **NightSat Mission Concept (1QFY08) – active**

✓ *NGS Aerial Photography (1QFY08) – NLAI*

- **DMSP Data in CLASS (1QFY08) – active**

✓ *Migrate the DMSP OLS Archive to CLASS (2QFY07) – O.B.E.*

✓ *ADIC-API Needed (1QFY07) – NLAI*

NLAI = No Longer An Issue

Issues & Summary

Solar & Terrestrial Physics Division

- **All performance measures achieved – 1milestone cancelled**
- **SWx Team Off-site held on August 18th – Report completed**

Other Items (not reported herein):

- ✓ **SEM-N Algorithm Requirements Review – Nov 17th**
- ✓ **New STP web pages available for review & comment**
  http://www.ngdc.noaa.gov/stp/STP_NEW_DEVEL/stp.html
- ✓ **Russian attempts to obscure gas flaring?**

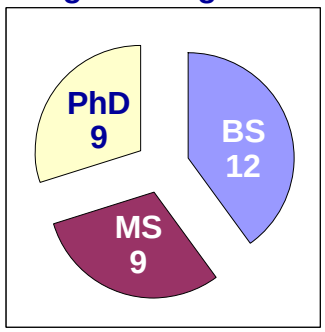
Metrics (YTD)

Papers published: 24 **Reports: 36**

Papers presented: 46 **Professional Societies:17**

Fellows: 1

Highest Degree



QUESTIONS?